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(NASA-TM-84177) DOCUMENTATION FOR THE
MACHINE-READABLE VERSION OF THE ABSOLUTE
CALIBRATION OF STELLAR SPECTROPHOTOMETRY
(NASA) 10 p HC A02/MF A01

CSCL 03A

N82-23081

Unclas
GJ/89 09804



National Space Science Data Center/
World Data Center A For Rockets and Satellites

82-11

DOCUMENTATION FOR THE MACHINE-READABLE VERSION

OF

THE ABSOLUTE CALIBRATION OF STELLAR SPECTROPHOTOMETRY

MARCH 1982



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March 1982

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SECTION 1 - INTRODUCTION

This machine-readable data file contains the absolute fluxes for 16 stars published in Tables 1 and 2 of Johnson (1980). The absolute calibrations were accomplished by combining the 13-color photometry calibrations of Johnson and Mitchell (1975) with spectra obtained with a Michelson spectrophotometer and covering the wavelength range 4000 to 10300 Å (Johnson 1977). The agreement between this absolute calibration and another recent one based upon data for α Lyr and 109 Vir by Tüg, White and Lockwood (1977) is shown by Johnson (1980) to be quite good.

This document describes the machine-readable data file of *The Absolute Calibration of Stellar Spectrophotometry* as distributed by the Astronomical Data Center. It is intended to enable users to read and process the data without problems and guesswork. The source reference should be consulted for additional details regarding the calibration methods and data quality. This document should be distributed with any machine-readable copy of the data file.

SOURCE REFERENCE

Johnson, H. L. 1980, *Rev. Mexicana Astron. Astrof.* 5, 25.

SECTION 2 - TAPE CONTENTS

Since this data file contains arrays of fluxes having the same number of elements for each of the sixteen stars, the format is best outlined in descriptive rather than tabular form. The data for each star are contained in eleven logical records, the first of which is always an identifier record composed of the Flamsteed or Bayer designation (e.g., ALF DEL, 109 VIR), number in Yale Catalogue of Bright Stars (Hoffleit 1964), and Henry Draper Catalogue (HD) number in bytes 1-8, 9-16, and 17-24, respectively. (The first data field is blank for stars without Flamsteed or Bayer designations.)

Records 2 to 11 contain the absolute flux data (units $\text{ergs cm}^{-2} \text{Hz}^{-1}$) in 9-byte fields, ten fields per record (record 11 contains only four fields). Since each group contains 94 flux values, the array can be read with a FORTTRAN implied DO loop using the following coding:

```
DIMENSION FLUX (94)
READ 20, (FLUX (I), I = 1, 94)      (1)
20 FORMAT (10E9.3)
```

The flux values begin at a corresponding wavelength of 4045 Å and increase to 10220 Å, but the increments vary in certain regions along the scale. Since the wavelength points are the same for all stars, they are contained the first six records of the file, 18 wavelength points per record (the sixth record contains only four data points). The wavelengths can be read with the following coding:

```
DIMENSION ILAM (94)
READ 10, (ILAM (I), I = 1, 94)      (2)
10 FORMAT (10I5)
```

In summary, the data should be read in the following manner:

1. Read the 94 wavelength values from the beginning of the file using (2).
2. Process each group of fluxes by first reading the identification record in format 3A8 (or 6A4 if each field is dimensioned for 2 x 32-bit words composed of 8-bit bytes; the A8 format can be used on 32-bit machines by declaring the identifiers DOUBLE PRECISION). Read the following ten flux data records using (1).

SECTION 3 - TAPE CHARACTERISTICS

The information contained in Table 1 is sufficient for a user to describe the indigenous characteristics of the data file to a computer. Not included is information easily varied from installation to installation, such as block size (physical record length), blocking factor (number of logical records per physical record), total number of blocks, tape density, number of tracks, and internal coding (EBCDIC, ASCII, etc.). These parameters should always be transmitted if secondary copies of the file are supplied to other users or installations.

Table 1. Tape Characteristics. *The Absolute Calibration of Stellar Spectrophotometry.*

NUMBER OF FILES	1
LOGICAL RECORD LENGTH	90
RECORD FORMAT	FB*
TOTAL NUMBER OF LOGICAL RECORDS	182

* Fixed block length (last block may be short)

SECTION 4 - REMARKS AND REFERENCES

The data in Tables 1 and 2 of Johnson (1980) were punched to cards, verified and checked at the Astronomical Data Center, NASA Goddard Space Flight Center. They were transformed from the format of the tables to the array format by a simple processing program.

REFERENCES

- Hoffleit, D. 1964, *Catalogue of Bright Stars*, 3rd edition (New Haven: Yale University Observatory).
- Johnson, H. L. 1977, *Rev. Mexicana Astron. Astrof.* 2, 219.
- Johnson, H. L. 1980, *Rev. Mexicana Astron. Astrof.* 5, 25.
- Johnson, H. L. and Mitchell, R. I. 1975, *Rev. Mexicana Astron. Astrof.* 1, 299.
- Tüg, H., White, N. M. and Lockwood, G. W. 1977, *Astron. Astrophys.* 61, 79.

SECTION 5 - SAMPLE LISTING

The sample listing given on the following pages contains logical data records exactly as they are recorded on the tape. The listing for the beginning of the file shows the wavelength array records and the first two complete groups of flux data records, while the listing for the end of the file displays the final two groups of flux data records. The beginning and end of each data record are indicated by the column heading index across the top of each page (digits read vertically).

ORIGINAL PAGE IS
OF POOR QUALITY

1.876E-21 1.800E-21 1.710E-21 1.688E-21

[illegible]

TAPE FILE NAME: ABS. CAL. STELLAR SPECT.

TAPE FILE 25

INPUT VOLSER WRS012

3
 NM
 HIX
 JDE
 LAD
 OEN
 CHI

109	VIRRR	551HDT30109	1.562E-211.509E-211.536E-211.497E-211.414E-211.400E-211.393E-211.402E-211.400E-211.430E-211.430E-211.430E-211.420E-211.365E-211.337E-211.306E-211.310E-211.287E-211.249E-211.231E-211.230E-211.218E-211.222E-211.216E-211.213E-211.199E-211.205E-211.197E-211.186E-211.173E-211.165E-211.163E-211.166E-211.129E-211.136E-211.124E-211.119E-211.112E-211.100E-211.090E-211.075E-211.052E-211.056E-211.054E-211.039E-211.020E-219.931E-229.913E-229.829E-229.743E-229.631E-229.651E-229.577E-229.346E-229.291E-229.257E-229.167E-229.109E-228.947E-229.003E-222.8.913E-228.888E-228.866E-228.793E-228.758E-228.574E-228.467E-228.308E-228.285E-228.096E-222.8.068E-228.027E-227.896E-227.888E-227.795E-227.776E-227.785E-227.733E-227.667E-227.532E-222.7.734E-227.993E-228.241E-228.418E-228.368E-228.212E-228.212E-228.020E-227.641E-227.537E-222.7.466E-227.177E-226.845E-226.767E-22	
172	ZET	PEGRR	463JHDT14923	2.374E-212.250E-212.270E-212.192E-212.019E-211.985E-211.961E-211.962E-211.948E-211.980E-211.965E-211.961E-211.939E-211.845E-211.801E-211.755E-211.756E-211.719E-211.664E-211.637E-211.632E-211.613E-211.615E-211.605E-211.599E-211.578E-211.578E-211.585E-211.572E-211.555E-211.537E-211.523E-211.517E-211.519E-211.466E-211.471E-211.453E-211.443E-211.429E-211.410E-211.394E-211.372E-211.341E-211.343E-211.338E-211.317E-211.293E-211.255E-211.252E-211.241E-211.229E-211.215E-211.217E-211.207E-211.178E-211.170E-211.166E-211.154E-211.147E-211.126E-211.133E-211.121E-211.118E-211.115E-211.106E-211.101E-211.078E-211.064E-211.044E-211.041E-211.017E-211.014E-211.009E-219.921E-229.912E-229.796E-229.773E-229.787E-229.722E-229.641E-229.472E-222.9.724E-221.004E-211.035E-211.056E-211.048E-211.027E-211.027E-211.001E-219.497E-229.355E-222.9.252E-228.885E-228.458E-228.356E-22